

# How a Hurricane Develops

Wow!  
cumulonimbus.



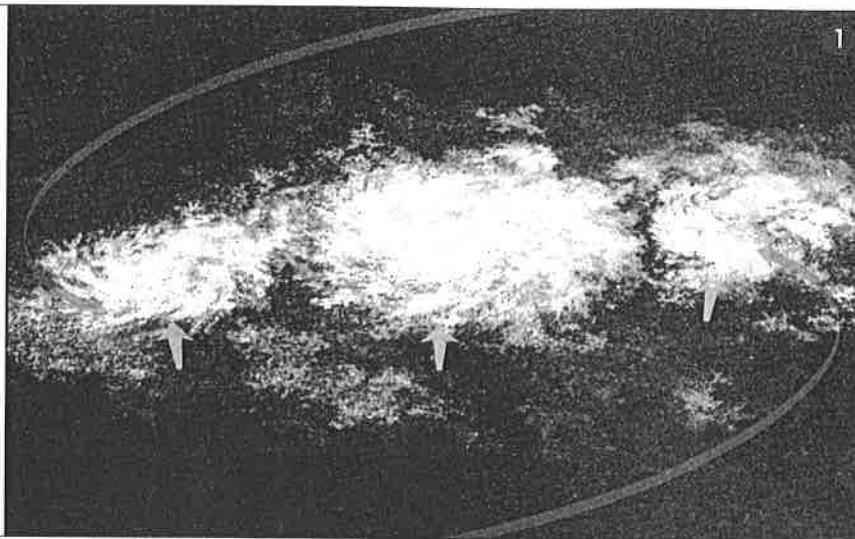
Why don't hurricanes ever form in Kansas, Oregon, or Vermont? Why do they always start in the tropics? It's because an area of the tropics that lies between five degrees north

and five degrees south latitude of the equator has ocean waters of at least 80°F over a large area. This is the first ingredient needed for a hurricane to develop. The second ingredi-

## Tropical Disturbance ①

When water condenses to form clouds, it releases its heat into the air. As air warms, it rises and is drawn into the cloud columns. The cloud columns grow larger and higher. Evaporation and condensation continue in a cycle. This cre-

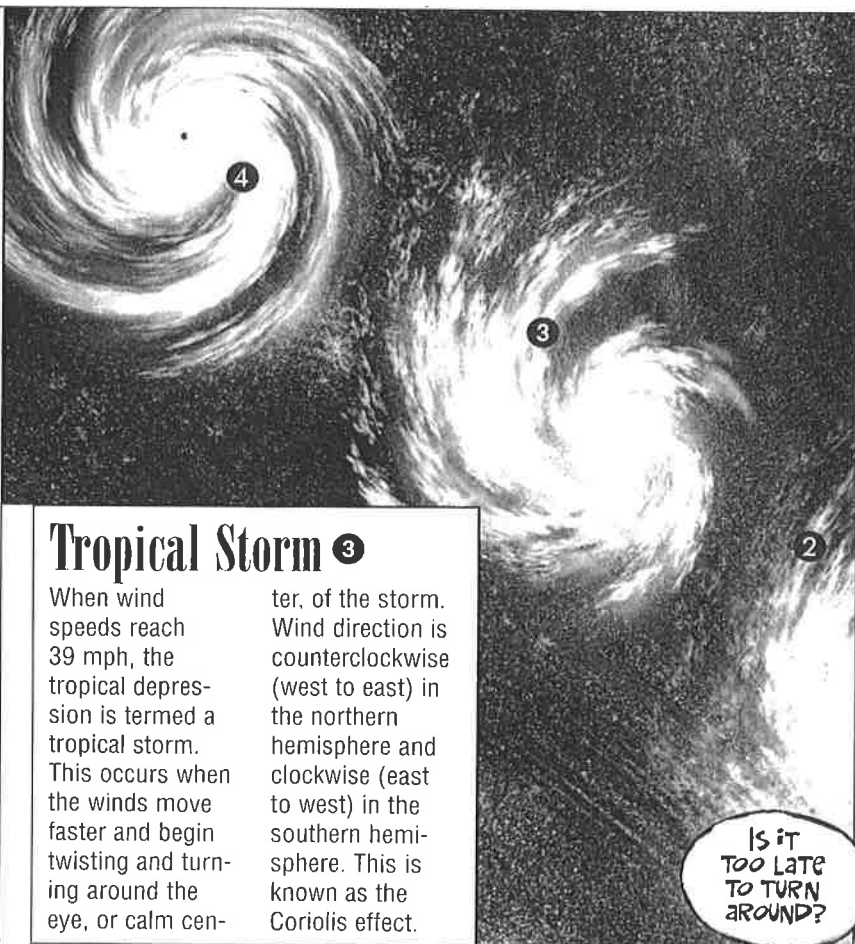
ates a pattern of wind that circulates around a center (similar to that of water going down a drain). As the moving column of air encounters more clouds, it becomes a cluster of thunderstorm clouds, called a tropical disturbance.



## Tropical Depression ②

When winds inside the cloud mass reach between 25 and 38 mph, weather forecasters call the storm a tropical depression. How do the wind speeds get this fast? Air molecules are in constant motion, pushing and pulling when striking objects. This push-or-pull force is called air pressure. At higher elevations, there are fewer air molecules, and air pressure decreases. Air flows from high- to low-pressure regions. This flow of air is called wind. The

greater the difference between the high- and low-pressure areas, the stronger the wind. As the thunderstorm grows higher and wider, the air at the top of the cloud column is cooling and creating an area of low pressure. This area of low pressure draws more and more warm air up toward it. Winds in the storm cloud column spin faster and faster, whipping around in a giant circular motion.



## Tropical Storm ③

When wind speeds reach 39 mph, the tropical depression is termed a tropical storm. This occurs when the winds move faster and begin twisting and turning around the eye, or calm cen-

ter, of the storm. Wind direction is counterclockwise (west to east) in the northern hemisphere and clockwise (east to west) in the southern hemisphere. This is known as the Coriolis effect.

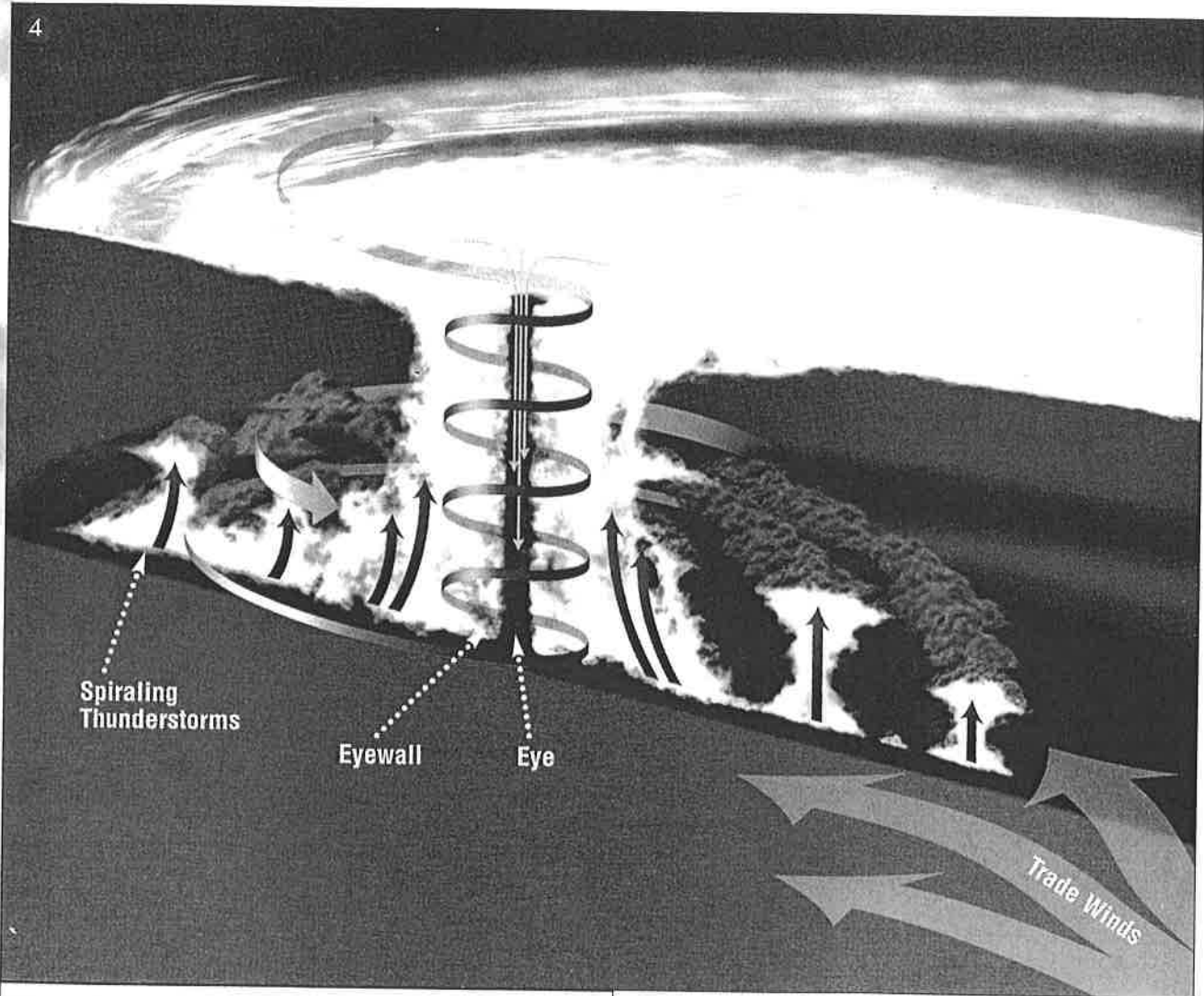
IS IT  
TOO LATE  
TO TURN  
AROUND?



ent is wind blowing westward off the continent of Africa.

Hurricanes feed on warm moist air rising from the Atlantic Ocean. Warm water evaporates (turns into water vapor) from the surface of the ocean and rises. As it rises, it cools. This causes the water vapor to condense

(to become more dense or compact), forming cumulonimbus clouds. A cumulonimbus is a very large thunderstorm cloud that extends to a great height. Once these clouds form, the first stage of hurricane development has begun.



## Hurricane ④

When wind speeds top 74 mph, the tropical storm is officially called a hurricane. Now the storm is not only high (over 50,000 feet) but also wide (about 125 miles in diameter). When air at the

top of the spiraling column merges with high-altitude air currents that do not change much in direction and speed, the air goes in the opposite direction. However, some of the now-dry air is forced back down the center

of the spiral—the relative calm of the eye. The eye, a low-pressure region, is anywhere from 5 to 30 miles wide. Trade winds from the western coast of Africa propel the hurricane's track from east to west.

## The End ⑤

Hurricanes weaken when they encounter land because warm ocean waters are no longer available to fuel their growth. Over land, during a time period of



no more than two or three days, wind speeds decrease, so the storm is no longer called a hurricane.

However, hurricanes can cause a lot of trouble before they turn out to sea again, or before they die out entirely.